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FAX TRANSMISSION

DICKSTEIN SHAPIRO MORIN & OSHINSKY LLP

DATE: May 12, 2004

CLIENT NO.: M4065.0536/P536

MESSAGE TO: Ms. Wynette Stapor

COMPANY: USPTO

FAX NUMBER: 571-273-1626

PHONE:

FROM: Gabriela Coman TIMEKEEPER NO.:

PHONE: 202-775-4706

PAGES (Including Cover Sheet): 22 HARD COPY TO FOLLOW: ____ YES __X__ NO

SENT BY:		DATE/TIME:	

MESSAGE:

Re Serial No: 09/855,532

As per our discussion today, please see attached Response to Notice of Abandonment filed February 11, 2004.

Thank you for your assistance in this matter.

Please confirm receipt of this facsimile transmission.

RECEIVED
MAY 1 2 2004
Technology Center 2800

1766347 v1; 11WGR01!.DOC

Atty Docket No.: M4065.0439/P439

Inventor: Joseph E. Geusic et al.

Application No.: 09/855,532-Conf. #9772 Filing Date: May 16, 2001

Title: METHOD OF FORMING MIRRORS BY SURFACE TRANSFORMATION OF EMPTY SPACES IN SOLID STATE MATERIALS

Documents Filed:

Response to Notice of Abandonment w/attachment (19 pages)

Notice of Abandonment (1 page)

Via: PTO Daily Run

Sender's Initials: TJD/GC/meb

Date: February 11, 2004

UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NUMBER	FILING OR 371(C) DATE	FIRST NAMED APPLICANT	ATTY DOCKET NO./TITLE
09/855,532	05/16/2001	Joseph E. Geusic	M4065.0439/P439

CONFIRMATION NO. 9772

ABANDONMENT/TERMINATION LETTER

OC000000011851742

24998
DICKSTEIN SHAPIRO MORIN & OSHINSKY LLP
2101 L STREET NW
WASHINGTON, DC 20037-1526

Date Mailed: 02/06/2004

NOTICE OF ABANDONMENT UNDER 37 CFR 1.53 (f) OR (g)

The above-identified application is abandoned for failure to timely or properly reply to the Notice to File Missing Parts (Notice) mailed on 07/17/2001.

- No reply was received.

A petition to the Commissioner under 37 CFR 1.137 may be filed requesting that the application be revived.

Under 37 CFR 1.137(a), a petition requesting the application be revived on the grounds of **UNAVOIDABLE DELAY** must be filed promptly after the applicant becomes aware of the abandonment and such petition must be accompanied by: (1) an adequate showing of the cause of unavoidable delay; (2) the required reply to the above-identified Notice; (3) the petition fee set forth in 37 CFR 1.17(l); and (4) a terminal disclaimer if required by 37 CFR 1.137(d).

Under 37 CFR 1.137(b), a petition requesting the application be revived on the grounds of **UNINTENTIONAL DELAY** must be filed promptly after applicant becomes aware of the abandonment and such petition must be accompanied by: (1) a statement that the entire delay was unintentional; (2) the required reply to the above-identified Notice; (3) the petition fee set forth in 37 CFR 1.17(m); and (4) a terminal disclaimer if required by 37 CFR 1.137(d).

Any questions concerning petitions to revive should be directed to the "Office of Petitions" at (703) 305-9282.Petitions should be mailed to: Mail Stop Petitions, Commissioner for Patents, P.O. Box 1450, Alexandria VA 22313-1450.

A copy of this notice MUST be returned with the reply.

Customer Service Center
Initial Patent Examination Division (703) 308-1202
PART 2 - COPY TO BE RETURNED WITH RESPONSE

Docket No.: M4065.0439/P439
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Joseph E. Geusic et al.

Application No.: 09/855,532 Confirmation No.: 9772

Filed: May 16, 2001 Art Unit: 2811

For: METHOD OF FORMING MIRRORS BY SURFACE TRANSFORMATION OF EMPTY SPACES IN SOLID STATE MATERIALS Examiner: Not Yet Assigned

PETITION FOR WITHDRAWAL OF ERRONEOUS HOLDING OF ABANDONMENT

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

Responsive to the Notice of Abandonment dated February 6, 2004, Applicants submit that the Notice of Abandonment is erroneous and Applicants petition for its withdrawal.

Applicants note that the Notice of Abandonment is based on Applicants' alleged failure to timely reply to the Notice to File Corrected Application Papers dated July 17, 2001. Applicants submit, however, that a Response to Notice to File Corrected Application Papers (filing date granted) was timely filed on September 17, 2001. A copy of the Response to Notice to File Corrected Application Papers dated September 17, 2001 and a copy of the receipt postcard confirming the PTO's timely receipt of the

Application No.: 09/855,532 Docket No.: M4065.0439/P439

Response are attached. Accordingly a return of this application to an active status is respectfully requested.

It is respectfully submitted that this Petition is necessary due to PTO error and that no fee is due. If a petition fee is due it may be charged to our Deposit Account No. 04-1073, under Order No. M4065.0439/P439.

Dated: February 11, 2004

Respectfully submitted,

By_____

Thomas J. D'Amico
Registration No.: 28,371
Gabriela I. Coman
Registration No.: 50,515
DICKSTEIN SHAPIRO MORIN &
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2101 L Street NW
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Attorneys for Applicants

Atty Docket No.: M4065.0439/P439

Inventor: Joseph E. Geusic, et al.

Application No.: 09/855,532 Filing Date: May 16, 2001

Title: METHOD OF FORMING MIRRORS BY SURFACE TRANSFORMATION OF EMPTY SPACES IN SOLID STATE MATERIALS

Documents Filed:
Notice to File Corrected Application Papers (18 pages)

Via: PTO Daily Run

Sender's Initials: TJD/GC/meb

Date: September 17, 2001

TM 9/17

UNITED STATES PATENT AND TRADEMARK OFFICE

COMMISSIONER FOR PATENTS
UNITED STATES PATENT AND TRADEMARK OFFICE
WASHINGTON, D.C. 20231
www.uspto.gov

APPLICATION NUMBER	FILING/RECEIPT DATE	FIRST NAMED APPLICANT	ATTORNEY DOCKET NUMBER
09/855,532	05/16/2001	Joseph E. Geusic	M4065.0439/P439

CONFIRMATION NO. 9772

FORMALITIES LETTER

OC000000006305103

Thomas J. D'Amico
DICKSTEIN SHAPIRO MORIN & OSHINSKY LLP
2101 L Street NW
Washington, DC 20037-1526

JUL 19 2001

Date Mailed: 07/17/2001

NOTICE TO FILE CORRECTED APPLICATION PAPERS

Filing Date Granted

This application has been accorded an Application Number and Filing Date. The application, however, is informal since it does not comply with the regulations for the reason(s) indicated below. Applicant is given **TWO MONTHS** from the date of this Notice within which to correct the informalities indicated below. Extensions of time may be obtained by filing a petition accompanied by the extension fee under the provisions of 37 CFR 1.136(a)

The required item(s) identified below must be timely submitted to avoid abandonment:

- The Claim(s) commencing on a separate sheet (37 CFR 1.75(h)).

A copy of this notice MUST be returned with the reply.

Customer Service Center
Initial Patent Examination Division (703) 308-1202
PART 1 - ATTORNEY/APPLICANT COPY

Docket No.: M4065.0161/P161-A
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Kevin J. Torek, et al.

Application No.: 09/632,088

Group Art Unit: 1763

Filed: August 2, 2000

Examiner: G. Goudreau

For: ACID BLEND FOR REMOVING ETCH RESIDUE

RESPONSE TO NOTICE TO FILE CORRECTED APPLICATION PAPERS

Commissioner for Patents
Washington, DC 20231

Dear Sir:

In response to the Notice to File Corrected Application Papers mailed July 17, 2001, Applicant respectfully submits the following claims commencing on a separate sheet.

Dated: September 17, 2001

Respectfully submitted,

By _____
Thomas J. D'Amico
Registration No.: 28,371
DICKSTEIN SHAPIRO MORIN & OSHINSKY LLP
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(202) 828-2232
Attorneys for Applicant

1344266 v1; ST8Q01!.DOC

What is claimed as new and desired to be protected by Letters Patent of the United States is:

1. A method of forming a reflective mirror within a substrate, comprising the act of forming at least one empty-spaced pattern beneath a surface of and within said substrate, said empty-spaced pattern being positioned along an optical path of said substrate and being surrounded by substrate material.

2. The method of claim 1 further comprising the act of forming a plurality of empty-spaced patterns beneath said surface of said substrate, said empty-spaced patterns being sequentially positioned along said optical path of said substrate and being surrounded by said substrate material.

3. The method of claim 2, wherein said empty-spaced patterns are spaced apart to provide a predetermined refraction index corresponding to said substrate.

4. The method of claim 3, wherein said empty-spaced patterns are spaced apart uniformly.

5. The method of claim 3, wherein said empty-spaced patterns are spaced apart nonuniformly.

6. The method of claim 3, wherein said empty-spaced patterns are spaced apart to provide a maximum reflectivity value corresponding to maximum electromagnetic wave reflection for said reflective mirror.

7. The method of claim 2, wherein said act of forming said empty-spaced patterns further comprises forming a plurality of holes within said substrate and annealing said substrate to form said empty-spaced patterns beneath said surface of said material.

8. The method of claim 7, wherein said holes are cylindrical holes.

9. The method of claim 7, wherein said substrate is annealed at a temperature lower than a melting temperature of said substrate material.

10. The method of claim 9, wherein said substrate is annealed under a hydrogen ambient.

11. The method of claim 9, wherein said substrate is annealed for about 60 seconds.

12. The method of claim 2, wherein at least one of said empty-spaced patterns has a plate-shaped configuration.

13. The method of claim 2, wherein said empty-spaced patterns are plate-shaped empty-spaced patterns.

14. The method of claim 13, wherein said plate-shaped empty-spaced patterns have same thicknesses.

15. The method of claim 13, wherein said plate-shaped empty-spaced patterns have different thicknesses.

16. The method of claim 2, wherein said empty-spaced patterns are formed simultaneously.

17. The method of claim 2, wherein said substrate is a monocrystalline substrate.

18. The method of claim 17, wherein said substrate is a silicon substrate.

19. The method of claim 17, wherein said substrate is a quartz substrate.

20. The method of claim 17, wherein said substrate is a germanium substrate.

21. The method of claim 2, wherein said substrate is a gallium arsenide substrate.

22. The method of claim 2, wherein said substrate is an indium gallium arsenide substrate.

23. A method of modifying the transmission of an electromagnetic wave, said method comprising the steps of:

transmitting said electromagnetic wave through a monocrystalline substrate, said monocrystalline substrate comprising at least one plate-shaped empty spaced pattern within, and surrounded by, said monocrystalline substrate, and below a surface of said monocrystalline substrate, said at least one plate-shaped empty spaced pattern being positioned along a transmission axis of said electromagnetic wave; and

phase-shifting said electromagnetic wave as it passes through said monocrystalline substrate.

24. The method of claim 23, wherein said electromagnetic wave is phase-shifted about 180 degrees.

25. The method of claim 23 further comprising the act of forming at least one hole within said monocrystalline substrate and annealing said monocrystalline substrate to form said at least one plate-shaped empty spaced pattern beneath said surface of said monocrystalline substrate.

26. The method of claim 25, wherein said act of annealing is performed under a reducing atmosphere.

27. The method of claim 26, wherein said reducing atmosphere is a hydrogen atmosphere at a temperature lower than the melting temperature of said monocrystalline substrate.

28. The method of claim 23 further comprising the act of forming at least two plate-shaped empty spaced patterns positioned along said transmission axis of said electromagnetic wave.

29. The method of claim 28, wherein said at least two plate-shaped empty spaced patterns are formed sequentially.

30. The method of claim 28, wherein said at least two plate-shaped empty spaced patterns are formed simultaneously.

31. The method of claim 30, wherein one of said plate-shaped empty spaced patterns is located below said other plate-shaped empty spaced pattern relative to said surface of said monocrystalline substrate.

32. The method of claim 30, wherein said plate-shaped empty spaced patterns have same thicknesses.

33. The method of claim 30, wherein said plate-shaped empty spaced patterns have different thicknesses.

34. The method of claim 23, wherein said monocrystalline substrate is a germanium substrate.

35. The method of claim 23, wherein said monocrystalline substrate is a silicon substrate.

36. The method of claim 23, wherein said monocrystalline substrate is a silicon-on-insulator substrate.

37. The method of claim 23, wherein said monocrystalline substrate is a silicon-on-nothing substrate.

38. The method of claim 23, wherein said monocrystalline substrate is a gallium arsenide substrate.

39. A method of forming a reflective mirror within a substrate, said method comprising the acts of:

forming a plurality of cylindrical holes within said substrate, each of said plurality of cylindrical holes being defined by a radius $R = \lambda/4\ [(2k+1)/n + (2m+1)]\ (1/8.89)$, wherein λ is a wavelength for which the reflectivity of said reflective mirror is maximum, n is the refraction index of said substrate, and k and m are real integers, and wherein any two adjacent cylindrical holes are spaced apart by a distance $\Delta_N^2 = 27.83\ R^3/(2m+1)\ \lambda/4$; and

annealing said substrate to form at least one empty-spaced pattern beneath a surface of and within said substrate, said empty-spaced pattern being positioned along an optical path of said substrate.

40. The method of claim 39 further comprising the act of forming a plurality of empty-spaced patterns beneath said surface of said substrate, said empty-spaced patterns being sequentially positioned along said optical path of said substrate and being surrounded by substrate material.

41. The method of claim 40, wherein said substrate is annealed at a temperature lower than a melting temperature of said substrate.

42. The method of claim 41, wherein said substrate is annealed under a hydrogen ambient.

43. The method of claim 40, wherein said empty-spaced patterns are plate-shaped empty-spaced patterns.

44. The method of claim 43, wherein said plate-shaped empty-spaced patterns have same thicknesses.

45. The method of claim 43, wherein said plate-shaped empty-spaced patterns have different thicknesses.

46. The method of claim 43, wherein said plate-shaped empty-spaced patterns are formed simultaneously.

47. The method of claim 43, wherein said plate-shaped empty-spaced patterns are spaced apart uniformly.

48. The method of claim 43, wherein said plate-shaped empty-spaced patterns are spaced apart non-uniformly.

49. The method of claim 40, wherein said substrate is a monocrystalline substrate.

50. The method of claim 49, wherein said substrate is a silicon substrate.

51. The method of claim 49, wherein said substrate is a quartz substrate.

52. The method of claim 49, wherein said substrate is a germanium substrate.

53. The method of claim 40, wherein said substrate is a gallium arsenide substrate.

54. The method of claim 40, wherein said substrate is an indium gallium arsenide substrate.

55. An integrated circuit substrate comprising at least one reflective mirror provided beneath a surface of, and within, a semiconductor substrate, said reflective mirror comprising at least one empty-spaced pattern beneath said surface of and within said substrate, said at least one empty-spaced pattern being positioned along an optical path of said substrate and being surrounded by substrate material.

56. The integrated circuit of claim 55 further comprising a plurality of empty-spaced patterns beneath said surface of and within said substrate, said empty-spaced patterns being sequentially positioned along said optical path of said substrate and being surrounded by said substrate material.

57. The integrated circuit of claim 56, wherein said plurality of empty-spaced patterns are spaced apart uniformly.

58. The integrated circuit of claim 56, wherein said plurality of empty-spaced patterns are spaced apart non-uniformly.

59. The integrated circuit of claim 56, wherein each of said plurality of empty-spaced patterns has a respective refraction index.

60. The integrated circuit of claim 56, wherein said plurality of empty-spaced patterns has a maximum reflectivity value corresponding to maximum electromagnetic wave reflection for said reflective mirror.

61. The integrated circuit of claim 56, wherein said empty-spaced patterns are plate-shaped empty-spaced patterns.

62. The integrated circuit of claim 61, wherein said plate-shaped empty-spaced patterns have same thicknesses.

63. The integrated circuit of claim 61, wherein said plate-shaped empty-spaced patterns have different thicknesses.

64. The integrated circuit of claim 56, wherein said semiconductor substrate is a silicon substrate.

65. The integrated circuit of claim 56, wherein said semiconductor substrate is a quartz substrate.

66. The integrated circuit of claim 56, wherein said semiconductor substrate is a germanium substrate.

67. The integrated circuit of claim 56, wherein said semiconductor substrate is a silicon-on-insulator substrate.

68. The integrated circuit of claim 56, wherein said semiconductor substrate is a silicon-on-nothing substrate.

69. The integrated circuit of claim 56, wherein said semiconductor substrate includes a laser.

70. The integrated circuit of claim 69, wherein said laser is a vertical cavity laser and said reflective mirror being is located below a junction of said vertical cavity laser.

71. The integrated circuit of claim 69, wherein said laser is a solid state ion laser, said reflective mirror being embedded within at least one end face of such solid state ion laser.

72. A laser device comprising a laser body for producing laser light and at least one mirror coupled to said laser body to reflect said laser light, said at least one mirror comprising at least one empty-spaced pattern beneath a surface of and within a substrate, said empty-spaced pattern being positioned along an optical path of said laser device and being surrounded by substrate material.

73. The laser device of claim 72, wherein said at least one mirror further comprises a plurality of empty-spaced patterns beneath said surface of and within said substrate, said empty-spaced patterns being sequentially positioned along said optical path of said laser device and being surrounded by said substrate material.

74. The laser device of claim 73, wherein said plurality of empty-spaced patterns are spaced apart uniformly.

75. The laser device of claim 73, wherein said plurality of empty-spaced patterns are spaced apart non-uniformly.

76. The laser device of claim 73, wherein each of said plurality of empty-spaced patterns has a respective refraction index.

77. The laser device of claim 73, wherein said plurality of empty-spaced patterns has a maximum reflectivity value corresponding to maximum laser wave reflection for said reflective mirror.

78. The laser device of claim 73, wherein said empty-spaced patterns are plate-shaped empty-spaced patterns.

79. The laser device of claim 78, wherein said plate-shaped empty-spaced patterns have same thicknesses.

80. The laser device of claim 78, wherein said plate-shaped empty-spaced patterns have different thicknesses.

81. The laser device of claim 72 further comprising at least two said mirrors coupled to opposite sides of said laser body to reflect said laser light.